

WHAT IS CLAIMED IS:

1. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing

5 the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the occupancy of the area, and maintain activation when sensing the occupancy of the area, comprising an infrared sensor section, adapted to passively sense the occupancy of the area, and to activate upon sensing the occupancy of the area,

10 and an ultrasonic sensor section, adapted to actively sense the occupancy of the area, and to activate upon sensing the occupancy of the area, wherein the occupancy sensor is adapted to activate when the infrared sensor section senses occupancy of the area, and to maintain activation when either the infrared sensor section or the ultrasonic sensor section senses continuing occupancy of the area.

2. The system of claim 1, further comprising a setting element, for enabling the input of a setting for the activating of the occupancy sensor, and a self-adjusting element, for enabling the self-adjusting of the activating setting, for the activating of the occupancy sensor.

3. The system of claim 1, wherein the occupancy sensor is adapted to activate upon sensing motion in the area.

4. The system of claim 1, further comprising an element for responding to motion varying from a baseline motion so as to require a constant level of such motion in order to activate the occupancy sensor.

5. The system of claim 1, further comprising a building automation system relay, adapted to be connected to the occupancy sensor and a building automation system.

6. The system of claim 1, further comprising an alarm relay, adapted to be connected to the occupancy sensor and to an alarm system, and wherein the setting element comprises a switch adapted to enable the selection of an alarm mode setting, adapted to require multiple activations of the infrared sensor section and the ultrasonic sensor section within a preset time period to activate the alarm relay.

7. The system of claim 1, further comprising an interface for enabling manual setting for activation of the occupancy sensor.

8. The system of claim 1, wherein the occupancy sensor is adapted to maintain activation when both the infrared sensor section and the ultrasonic sensor section are activated.

9. The system of claim 1, adapted to be connected to a system to be controlled thereby.

10. The system of claim 1, further including a switch, wherein the switch is further adapted to enable selection of a lighting sweep setting, to prevent false activation in a power sweep facility.

11. The system of claim 2, wherein the activating setting includes a sensitivity setting for the occupancy sensor.

12. The system of claim 2, wherein the activating setting includes a time delay setting for the occupancy sensor.

13. The system of claim 2, wherein the self-adjusting element is adapted to self-adjust the settings responsive to real-time adjustment.

14. The system of claim 2, wherein the occupancy sensor further includes an element for detecting a fault in the operation thereof, and the self-adjusting element is adapted to self-adjust the settings responsive to the fault detection.

15. The system of claim 2, further adapted to be self-resetting.

16. The system of claim 3, further comprising a filtering element for filtering out the portion of the frequency spectrum related to air movement, for preventing false activation of the occupancy sensor.

17. The system of claim 5, further comprising a switch interface for enabling manual activation of the occupancy sensor such that the building automation system relay remains active during occupancy.

18. The system of claim 6, adapted to provide redundant detection testing so as to avoid false alarms.

19. The system of claim 7, wherein the interface comprises a push button interface.

20. The system of claim 7, wherein the manual activating setting comprises a time delay setting for the occupancy sensor, and the occupancy sensor is adapted to automatically deactivate after manual activation following the time delay.

21. The system of claim 9, wherein the controlled system comprises a lighting system.

22. The system of claim 9, wherein the controlled system comprises a heating and air conditioning system.

23. The system of claim 10, further comprising a setting element, for enabling the input of a setting for the activating of the occupancy sensor, and a building automation system relay, adapted to be connected to the occupancy sensor and a building automation system, and wherein the setting element
5 comprises a switch adapted to enable selection of the lighting sweep setting for the building automation system relay.

24. The system of claim 10, further comprising a setting element, for enabling the input of a setting for the activating of the occupancy sensor, and an output control, adapted to be connected to the occupancy sensor and an output control system, and wherein the setting element comprises a switch adapted to
5 enable selection of the lighting sweep setting for the output control system.

25. The system of claim 12, wherein the time delay setting comprises a zero time delay setting for a system adapted to be connected to the occupancy sensor which includes an internal timing function.

26. The system of claim 20, further including a grace timer, adapted to automatically activate the occupancy sensor within a grace period comprising a preset time after deactivation thereof.

27. The system of claim 26, further including an automatic-on mode, and adapted to be self-resetting, and wherein the self-resetting is adapted such that upon manual setting of a lights turned-off setting, in the system automatic-on mode, the lights stay off during occupancy, and upon vacating the area and elapse
5 of the time delay and grace period, the lights turn on automatically the next time the area is entered.

28. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the
5 occupancy of the area, and maintain activation when sensing the occupancy of the area; and

a setting element, for enabling the input of a setting for the activating of the occupancy sensor, and a self-adjusting element, for enabling the self-adjusting of the activating setting, for the activating of the occupancy sensor.

29. The system of claim 28, wherein the activating setting includes a sensitivity setting for the occupancy sensor.

30. The system of claim 28, wherein the activating setting includes a time delay setting for the occupancy sensor.

31. The system of claim 28, wherein the self-adjusting element is adapted to self-adjust the settings responsive to real-time adjustment.

32. The system of claim 28, wherein the self-adjusting element is adapted to self-adjust the settings responsive to fault detection.

33. The system of claim 28 further adapted to be self-resetting.

34. The system of claim 30, wherein the time delay setting comprises a zero time delay setting for a system adapted to be connected to the occupancy sensor which includes an internal timing function.

35. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the occupancy of the area, and maintain activation when sensing the occupancy of the area, including an element for detecting a fault in the operation thereof; and

a setting element, for enabling the input of a setting for the activating of the occupancy sensor, and a self-adjusting element, for enabling the self-adjusting of the activating setting responsive to the fault detection.

36. The system of claim 35, wherein the self-adjusting setting includes a sensitivity setting, adapted to be self-adjusting responsive to the fault detection.

37. The system of claim 35, wherein the self-adjusting setting includes a time delay setting, adapted to be self-adjusting responsive to the fault detection.

38. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the
5 occupancy of the area, and maintain activation when sensing the occupancy of the area; and

an element for responding to motion varying from a baseline motion so as to require a constant level of such motion in order to activate the occupancy sensor.

39. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the
5 occupancy of the area, and maintain activation when sensing the occupancy of the area; and

a building automation system relay, adapted to be connected to the occupancy sensor and a building automation system.

40. The system of claim 39, further comprising a switch interface for enabling manual activation of the occupancy sensor such that the building automation system relay remains active during occupancy.

41. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the
5 occupancy of the area, and maintain activation when sensing the occupancy of the area; and

an alarm relay, adapted to be connected to the occupancy sensor and to an alarm system, and wherein the setting element comprises a switch adapted to enable the selection of an alarm mode setting, adapted to require multiple
10 activations of the occupancy sensor within a preset time period to activate the alarm relay.

42. The system of claim 41, adapted to provide redundant detection testing so as to avoid false alarms.

43. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

an occupancy sensor, adapted to activate upon sensing the
5 occupancy of the area, and maintain activation when sensing the occupancy of the area; and

an interface for enabling manual setting for activation of the occupancy sensor.

44. The system of claim 43, wherein the interface comprises a push button interface.

45. The system of claim 43, wherein the manual activating setting comprises a time delay setting for the occupancy sensor, and the occupancy sensor is adapted to automatically deactivate after manual activation following the time delay.

46. The system of claim 45, further including a grace timer, adapted to automatically activate the occupancy sensor within a grace period comprising a preset time after deactivation thereof.

47. The system of claim 46, further including an automatic-on mode, and adapted to be self-resetting, and wherein the self-resetting is adapted such that upon manual setting of a lights turned-off setting, in the system automatic-on mode, the lights stay off during occupancy, and upon vacating the area and elapse
5 of the time delay and grace period, the lights turn on automatically the next time the area is entered.

48. A system for sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, comprising:

means for sensing occupancy of the area, adapted to activate upon
5 sensing the occupancy of the area, and maintain activation when sensing the
occupancy of the area, comprising infrared means for sensing occupancy of the
area, adapted to passively sense the occupancy of the area, and to activate upon
sensing the occupancy of the area, and ultrasonic means for sensing occupancy
of the area, adapted to actively sense the occupancy of the area, and to activate
10 upon sensing the occupancy of the area, wherein the occupancy sensing means
is adapted to activate when the infrared means senses occupancy of the area, and
to maintain activation when either the infrared means or the ultrasonic means
senses continuing occupancy of the area.

49. The system of claim 48, further comprising means for enabling the input of a setting for the activating of the occupancy sensor, and means for enabling the self-adjusting of the activating setting means, for the activating of the occupancy sensing means.

50. A method of sensing the occupancy of an area, adapted to activate upon sensing the occupancy of the area, and to maintain activation when sensing the occupancy of the area, in a system which comprises an occupancy sensor, adapted to activate upon sensing the occupancy of the area, and maintain
5 activation when sensing the occupancy of the area, comprising an infrared sensor section, adapted to passively sense the occupancy of the area, and to activate upon sensing the occupancy of the area, and an ultrasonic sensor section, adapted

to actively sense the occupancy of the area, and to activate upon sensing the occupancy of the area, wherein the occupancy sensor is adapted to activate when
10 the infrared sensor section senses occupancy of the area, and to maintain activation when either the infrared sensor section or the ultrasonic sensor section senses continuing occupancy of the area, wherein the method comprises:

passively sensing the occupancy of the area and activating the occupancy sensor upon sensing the occupancy of the area in the infrared sensor section; and
15 maintaining activation of the occupancy sensor when either the infrared sensor section or the ultrasonic sensor section senses continuing occupancy of the area.

51. The method of claim 50, further comprising a setting element, for enabling the input of a setting for the activating of the occupancy sensor, and a self-adjusting element, for enabling the self-adjusting of the activating setting, for the activating of the occupancy sensor, further comprising inputting a setting for the
5 activating of the occupancy sensor, and self-adjusting the activating setting in the occupancy sensor for the activating of the occupancy sensor.

52. The method of claim 50, wherein the occupancy sensor is adapted to activate upon sensing motion in the area, and wherein activating comprises activating upon sensing motion in the area.

53. The method of claim 50, further comprising an element for responding to motion varying from a baseline motion so as to require a constant level of such motion in order to activate the occupancy sensor, and further comprising activating

the occupancy sensor in response to a constant level of motion which varies from
5 the baseline motion.

54. The method of claim 50, further comprising a building automation
system relay, adapted to be connected to the occupancy sensor and a building
automation system, and further comprising activating the building automation
system through the relay for the building automation system upon activation of the
5 occupancy sensor.

55. The method of claim 50, further comprising an alarm relay, adapted
to be connected to the occupancy sensor and to an alarm system, and wherein the
setting element comprises a switch adapted to enable the selection of an alarm
mode setting, adapted to require multiple activations of the infrared sensor section
5 and the ultrasonic sensor section within a preset time period to activate the alarm
relay, and further comprising selecting the alarm mode setting through the switch,
and activating the alarm system through the alarm relay, upon multiple activations
of the infrared sensor section and the ultrasonic sensor section within a preset time
period, for activation of the occupancy sensor.

56. The method of claim 50, further comprising an interface for enabling
manual setting for activation of the occupancy sensor, and further comprising
selecting the manual setting through the interface for activating the occupancy
sensor.

57. The method of claim 50, wherein the occupancy sensor is adapted to maintain activation when both the infrared sensor section and the ultrasonic sensor section are activated, and wherein maintaining activation comprises activating both the infrared sensor section and the ultrasonic sensor section.

58. The method of claim 50, adapted to be connected to a system to be controlled thereby, further comprising connecting the occupancy sensor to the system to be controlled thereby.

59. The method of claim 50, further including a switch, wherein the switch is further adapted to enable selection of a lighting sweep setting, to prevent false activation in a power sweep facility, further comprising selecting the lighting sweep setting in the switch.

60. The method of claim 51, wherein the activating setting includes a sensitivity setting for the occupancy sensor, further comprising activating the occupancy sensor responsive to the sensitivity setting of the occupancy sensor.

61. The method of claim 51, wherein the activating setting includes a time delay setting for the occupancy sensor, further comprising delaying the activation of the occupancy sensor responsive to the time delay setting of the occupancy sensor.